

# Drainage and Wastewater Management Plan

Summary of the methodology for the Baseline Risk and Vulnerability Assessment (BRAVA) on:

## Pollution Risk

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from  
**Southern  
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# 1. Background

## 1.1. Purpose

The purpose of this document is to provide a summary of the method for undertaking the Baseline Risk and Vulnerability Assessment (BRAVA) for the planning objective on **Pollution Risk**.

The BRAVA is an important step in the development of Drainage and Wastewater Management Plans (DWMPs). It is an assessment of current and future risks for each of the planning objectives below and is undertaken for the sewer catchments that were flagged during the Risk Based Catchment Screening (RBCS).

All Water and Sewerage Companies (WaSCs) are required to complete a BRAVA and report to Water UK on the following six common planning objectives:

1. Risk of sewer flooding in a 1 in 50-year storm
2. Storm overflow performance
3. Risk of WTW compliance failure
4. Internal sewer flooding risk
5. Pollution risk
6. Sewer collapse risk

We have developed this methodology in accordance with the Water UK guidance on '[BRAVA planning objectives for national reporting](#)' published on 29 July 2020. An extract from the Water UK guidance on the planning objective for pollution risk is provided in the Annex to this document.

## 1.2. Definitions

A pollution incident is defined by the Environment Agency (EA) in their [Environmental Performance Assessment \(EPA\) Methodology](#) as “a discharge or escape of a contaminant from a company sewerage asset affecting the water environment”. This does not include incidents impacting on air or land. Incidents affecting amenity of the water environment, for example, Bathing Waters, are included. Before 2020, the definition did not include pollution incidents from transferred/adopted private pumping stations or transferred/adopted private rising mains (transferred in 2016).

The EA applies a two-tier Common Incident Classification Scheme (CICS) to environmental incidents, including pollution. The first tier measures physical response and impact on EA business in dealing with the incident. The second tier describes the actual impact the incident has on the environment (people, property and the natural environment).

The second tier on the environmental impact categorisation, is split into four categories:

- Category 1 – major, serious, persistent and/or extensive impact or effect on the environment, people and/or property
- Category 2 – significant impact or effect on the environment, people and/or property
- Category 3 – minor or minimal impact or effect on the environment, people and/or property
- Category 4 – substantiated incident with no impact.

## 1.3. Reporting Requirements

Water UK guidance requires all WaSCs to report on the risk of pollution as a common Planning Objective.

Water UK only requires an assessment for the 2020 baseline.

For Water UK reporting purposes, the total number of serious pollutions (formerly Category 1 and 2) and Category 3 incidents which occurred through a failure of our wastewater infrastructure are reported for each sewer catchment and also collated for each of the 11 river basin catchments in our region.

Category 1, 2 and 3 incidents are counted equally for this measure.

## 2. Data Sources

The following is a short description of the data that has been used and where it has been obtained from.

### 2.1. Historic Incidents

Data has been obtained from our Pollution Incident Record Form (PIRF) database. This data source collates all the pollution incidents and details key information such as date of the incident, its location, the root cause and the category of the pollution.

### 2.2. Sewer Length

For the BRAVA, the pollution incident (per annum) is normalised per 10,000km of wastewater network as set out in Water UK guidance. Normalising the data allows the sewer catchments to be compared with each other using the same scale, illustrated in the example below;

Catchment	Average Annualised Number of Incidents	Adjusted Sewer Length (km)	Normalised per 10,000km
Budds Farm Havant	7.3	2,984	24.6
East Worthing	1	1,167	8.6

Data has been obtained from the SWS digital mapping database (called Asset Miner) to identify the length of the sewers in each of our sewer catchments. Recently adopted sewers that transferred ownership to us from private ownership under Section 105A of the Water Act 2003 are largely unmapped. However, an estimate of the length of these sewers is included in the total sewer length based on a study carried out by the Water Research Commission in 2008. An uplift multiplier of 1.70 was applied to the mapped sewer length to take account of the length of unmapped adopted sewers. The total length of all our sewers is 39,886 kilometres.

### 3. Method of Assessment

The following methodology has been developed to assess the level of risk of pollutions.

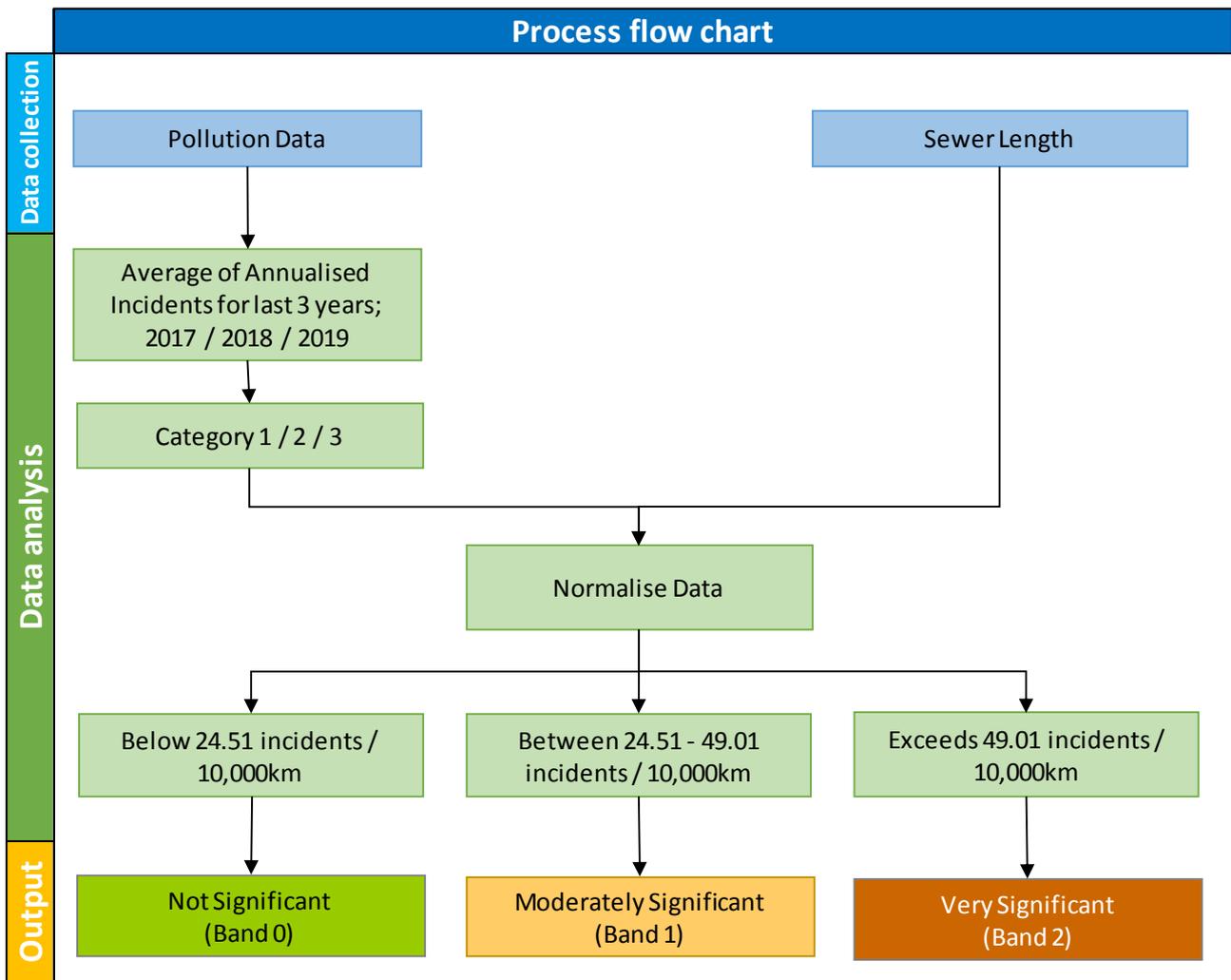
#### 3.1. Process – Baseline 2020 Assessment

The baseline assessment is carried out based on three years of actual recorded incidents. The process developed for this assessment is shown in Figure 1. It includes details of the source of information, how it is assessed and how the catchments are banded based on the results.

The baseline assessment uses data provided by the PIRF database on the previous three years (2017 / 18 / 19) and includes the adjusted sewer length to create data that is normalised to the number of incidents per 10,000km per annum.

The results are assigned a band (0, 1 or 2) to meet the Water UK reporting requirements, set out in section 3.3. In line with the RBCS, a catchment with only one category 3 incident recorded in the previous three years, is noted as 'Not Significant', as it assumes the incidents may not be related to the actual performance of the catchment.

Figure 1 - Process flow chart for the 2020 baseline Pollution Risk



## 3.2. Process – Future Assessment

Although at this stage we are not required by Water UK to forecast future pollution risk under this planning objective, our intention is to explore how we can incorporate an assessment of future pollution risks within the DWMP.

Historical data attributes most of the reported pollution incidents to blockages, for example, wet wipes, and failures of mechanical and electrical assets, for example, pumping stations within our wastewater networks. Both of these are difficult to predict for the short term, and hence the uncertainties will be much higher in any longer term forecasts.

We use an asset investment planning suite (called Pioneer) to support planning for future investment in our wastewater assets. Within Pioneer there are asset deterioration models that are used to predict asset failure and consequence, including the predicted future number of pollution events. In addition, we use an Asset Risk Management (ARM) module within the Pioneer suite to determine a risk score for pollution incidents over and above that predicted by deterioration modelling. The risk score derived within ARM is based on the likelihood of an incident taking place and the resulting consequences.

We will explore how to use the risk score in ARM in conjunction with the Pioneer deterioration model to predict future pollution risks arising from both the sewer network as well as treatment works and pumping stations for the future planning horizons up to 2050. Our aim is to incorporate this data and future assessment within the DWMP so future investment needs are identified across all the planning objectives.

## 3.3. Outputs from the BRAVA

The outputs from the BRAVA on Pollution Risk are a risk score for each sewer catchment. These scores are assigned to one of three bands as specified by Water UK. The thresholds for these bands are determined by each water company.

We have set the thresholds based on our AMP7 performance commitments to Ofwat. Band 0 (not significant) is for the sewer catchments that are performing better than the industry upper quartile performance in 2020 (set by Ofwat at 24.51). Band 2 (very significant) is based on the Ofwat performance target and is greater than the level at which the maximum penalty is capped for Southern Water. This is known as the “standard underperformance collar”. The threshold is therefore set at 49.01. Band 1 (moderately significant) then is the gap or range between Bands 0 and 2.

These targets are stricter and lower than the thresholds defined by the Environment Agency in its Environmental Performance Assessment report.

The assessment criteria (thresholds) and bands shown in the table below applies to the 2020 baseline assessments.

Assessment Criteria / Thresholds	Bands	
Equal or Below AMP 7 average Performance Target (24.51 incidents per 10,000km)	0	<i>Not Significant</i>
Between AMP 7 and AMP 6 average Performance Target (24.51 – 49.01 incidents per 10,000km)	1	<i>Moderately Significant</i>
Exceeds AMP 6 average Performance Target (49.01 incidents per 10,000km)	2	<i>Very Significant</i>

We have quality assured the draft results to ensure they have correctly identified the sewer catchments at greatest risk and will be taken forward for further consideration in the DWMP process. In “normalising” the data for sewer catchments based on the length of sewer, the results can be skewed for catchments with a relatively short length of sewer. We have therefore applied a moderation to ensure that sewer catchments where the annual average number of incidents is less than 1, these catchments are not in the very significant band. For these catchments, if there has been one incident in most recent year then they are considered as band 0, and if the annual average less than 1 but there has been two incidents in most recent year, then these catchments are considered as moderately significant as band 1.

## 4. Annex: Water UK guidance on the Planning Objective

<b>Planning Objective: Pollution Risk</b>	<p><b><u>Objective/Definition</u></b></p> <p>To be applied to all catchments that have triggered a BRAVA assessment through the RBCS process.</p> <p>This planning objective defines the ‘Pollution risk’. It allows for a comparison to be drawn between the likely scale of pollution risk. Covers pollution incidents as set out in Environmental Performance Assessment (EPA) relating to wastewater assets only and thus this measure will exclude non-sewer related pollutions such as water treatment/supply assets, third party private assets. This will include sewerage infrastructure, including pumping stations, WwTW and Sludge/Biosolids incidents. Comprising other causes (i.e. blockages, collapses and equipment failure) and those caused by hydraulic overload (i.e. sewer overflows operating outside permit conditions or due to overland rainfall induced pollution). It only includes Serious Pollutions (formerly Cat 1 and 2) and Category 3 incidents (aligned to RBCS). All pollutions counted equally for the purposes of this measure. Results to be presented as Baseline (2020) case only.</p>	<p><b><u>Definition clarifications</u></b></p> <p><b><u>Thresholds</u></b>                  Bands of 0, 1 &amp; 2 to be applied; with 0 as ‘Not Significant’, 1 as ‘Moderately Significant’ and 2 as ‘Very Significant’. Where a catchment does not trigger BRAVA, these will be flagged as ‘Not applicable’.</p> <p>Thresholds for bands to be developed by each company appropriate to their needs and to ensure outputs are meaningful to inform stakeholder engagement.</p> <p><b><u>Maps</u></b>                  To be produced at L2 to visually display bands 0, 1 &amp; 2.</p> <p><b><u>Tables</u></b>                  To be produced for L1, L2 &amp; L3 and include only 0, 1 &amp; 2 banding.</p>
	<p><b><u>Baseline Assessment</u></b></p> <ul style="list-style-type: none"> <li>• The baseline performance is to be based on best available model data.</li> <li>• Where a suitable model is not available, companies will use an average of last 3 years of annual performance.</li> <li>• The results are to be normalised based on connected sewer length to move between level 3, level 2 and level 1, in line with RBCS/EPA.</li> <li>• Each company will determine the thresholds it will use to ensure the results appropriately reflect their risk and provide an overview of their calculations.</li> </ul>	<p><b><u>2050 Assessment</u></b></p> <ul style="list-style-type: none"> <li>• Not to be produced for Cycle 1 but the potential for 2050 assessments to be produced for Cycle 2 to be considered in the ‘Cycle 1 to Cycle 2 review’.</li> </ul>